AMERICAN MUSEUM NOVITATES

Number 810 — Published by The American Museum of Natural History New York City — July 19, 1935

59.9, 2 P (95)

RESULTS OF THE ARCHBOLD EXPEDITIONS. NO. 5

SEVEN APPARENTLY NEW FORMS OF PHALANGERIDAE FROM THE NEW GUINEA REGION

By G. H. H. Tate and Richard Archbold

Continuing the practice already established of publishing preliminary descriptions[1] of new forms of mammals discovered in the Archbold collections, we offer in the following pages diagnoses of two races of *Petaurus*, subgenus *Petaurella;* one race each of *Pseudochirus*, subgenus *Pseudochirops* and subgenus *Pseudochirulus;* and three species of *Phalanger*.

Petaurus Shaw

The flying phalangers of New Guinea were distinguished by Thomas[2] as *papuanus*, a race of *P. breviceps* of Australia. Not only was *papuanus* promptly made a full species but in 1916 Matschie[3] erected the subgenera *Petaurella* for *papuanus* and *Petaurula* for *breviceps*.

Although Jentink[4] has suggested that the New Guinea flying phalangers may be susceptible of geographical separation, no action in this respect has hitherto been taken.

The type locality of *papuanus* Thomas is "Huon Gulf" and its characteristics indicate that it was the form prevalent in the lowlands of the eastern part of the islands. The two races proposed by us in the pages following are, in comparison with it, (1) a darkly pigmented form living in the high mountains of eastern and northeastern New Guinea, and (2) a strongly flavid form of the relatively open country in south New Guinea (Western Division).

Petaurus (Petaurella) papuanus tafa, new subspecies

Type.—No. 104028, American Museum Natural History; ♂, young adult; Eastern Ridge, Mt. Tafa, Central Division of Papua, 2000 meters; May 19, 1934; collectors, Richard Archbold and A. L. Rand. The type is a skin with skull, the latter with posterior parts broken.

[1] Amer. Mus. Novit., Nos. 801 to 804.
[2] 1888, 'Cat. Monotr. Marsup.,' p. 158.
[3] 1916, Mitt. Zool. Mus. Berlin, VIII, No. 2, p. 261.
[4] 1917, 'Nova Guinea,' V, p. 371.

GENERAL CHARACTERS.—The mountain representative of *papuanus* of eastern New Guinea, characterized by its infuscated ventral pelage and small molar teeth.

DESCRIPTION.—Type with long, soft dorsal fur (12 mm.) colored deep mouse-gray[1] but with a silvery sheen; median stripe fuscous black, slightly expanded on the head as in the lowland form, and reduced at the rump. Ears dark brown. Blackish eye-ring well developed all the way around. Membrane clothed above with blackish hairs; forearm similarly colored; digits and metacarpals black with slight wash of buffy; extreme fringe of membrane buffy from the tip of fifth digit to elbow, then whitish. Hind limb mixed dark gray and buffy whitish, the toes buff. Under parts with bases of hairs buff, followed by a zone of fuscous, and the extreme tips again dirty buff, the last giving the effect of a wash of buffy over fuscous. The hairs along midline from chin to chest have the yellowish of their tips slightly intensified; those of the scrotum are self-colored cartridge buff to their bases. The general ventral color extends onto patagium and limbs. Tail above mouse-gray, the terminal 5 cm. blackish mouse-gray, below drab, terminating in fuscous black.

Skull morphologically as in *p. papuanus;* smaller, due to a certain degree of immaturity. It differs primarily in possessing smaller molar teeth than has its lowland representative, see detailed measurements beyond.

MEASUREMENTS.—Head and body of type, 135 mm.; tail, 155; hind foot (s.u.), 23; skull, palatal length, 15.5; nasals, 12.2 × 5.2; interorbital breadth, 6.5. Teeth: p^4–m^4, 7.0 (8.0 to 8.2 in lowland representative); m^{1-3}, 4.9 (5.0–5.4); crown dimensions of m^1, 1.9 × 1.75 (2.2 × 1.9); of m^2, 1.6 × 1.7 (1.7 × 1.8).

To this form we refer two males taken by the Whitney South Sea Expedition at Sevia, Huon Peninsula, Mandated Territory, 1700 meters, which equally possess blackish ventral pelage and reduced molars.

Petaurus (Petaurella) papuanus flavidus, new subspecies

TYPE.—No. 104465, American Museum Natural History; ♂, adult; Dogwa, Oriomo River, Western Division of Papua, 30 meters; February 17, 1934; collectors, Richard Archbold and A. L. Rand. The type is a skin with skull, both in good condition.

GENERAL CHARACTERS.—A strongly flavid phase of *papuanus* in which the ventral hairs are self-colored to the bases and without trace of smoky, and the gray of the dorsal parts, particularly of the forearms and adjoining membrane, is heavily washed with yellow-brown. An inhabitant of the relatively open region of southern New Guinea.

DESCRIPTION.—Pelage of type short (8–9 mm. on back), its general color between drab and buffy brown, which extends onto the tail as wood brown or avellaneous, the terminal 5 cm. of which are fuscous. Dorsal stripe, tempered by the prevailing yellowish cast, not darker than bone brown, and the diamond-shaped portion on the crown is paler in the middle. Under parts in type a clear cream buff (chamois in some other specimens), scrotal hairs buckthorn brown, body color (cream buff) carried out for half length of tail, then gradually deepening through seal brown to fuscous.

Skull not distinguishable by us from that of true *papuanus*.

---

[1] Colors from Ridgway, 1912, 'Color Standards and Nomenclature.'

MEASUREMENTS.—Type, head and body, 149 mm.; tail, 171; hind foot (s.u.), 25; skull, occipitonasal length, 35.8; basal length, 30.4; zygomatic breadth, 25.8; interorbital breadth, 7.7; nasals, 12.3 × 6.2; palatal length, 7.0; teeth, p^4–m^4, 7.8; m^{1-3}, 5.3; crown dimension (length × breadth) of m^1, 2.1 × 2.0; of m^2, 1.8 × 1.9.

Mr. Archbold secured a large series of these flying phalangers from the Oriomo River, comprising, besides the type, five adult males, twelve adult females, and five each of juvenal males and females. In young animals the yellowish wash of the upper surface is scarcely developed and the under surface of the body is just off white—about equal to ivory yellow. Many adults have a strong wash of chamois or antimony yellow on the fringe of that part of the membrane attached to the carpus, which is lacking in other races of *papuanus*.

There is some possibility that our Oriomo race may be linked with *longicaudatus* Longman from the Gulf of Carpentaria, Queensland, although the tail in that race was reported as 190 mm. in length (in *flavidus*, 150–175 mm.).

PSEUDOCHIRUS OGILBY

Of the three subgenera of this genus, proposed by Matschie,[1] *Pseudochirops* and *Pseudochirulus* only are known from New Guinea. The former with type *albertisii* is a compact group containing large-sized species with distinctive skull characters; the latter with type *canescens* is more diversified, species at present referred to it varying in size from *caroli* to *pygmaeus*.

Pseudochirus (Pseudochirops) cupreus obscurior, new subspecies

TYPE.—No. 104114, American Museum Natural History; ♀, adult; west slope of Mt. Tafa, Central Division, Papua; 2400 meters; September 17, 1933; collectors, Richard Archbold and A. L. Rand. The type is a skin and skull, the latter with part of the left maxilla broken.

GENERAL CHARACTERS.—Similar to but smaller and much darker than *cupreus* of the highlands (of which specimens are also at hand for comparison).

DESCRIPTION.—Pelage of type almost as dense as that of *cupreus*, its color darkened by a greater admixture of fuscous to the prevailing coppery brown, the median black stripe extended forward onto the crown and backward to the glandular area at the base of the tail; face dark grayish brown; tail from commencement of glandular area to termination of the portion bearing body-hairs dull chocolate brown, near bone brown, almost lacking any suggestion of coppery; terminal part of tail with adpressed blackish hairs as in *cupreus*. Ventrally as in *cupreus*, with white chest and inguinal patches, the remainder of under parts with the hair-tips grayer and less rufescent. Arms, legs, hands, and feet as in *cupreus* but with the coppery shades dulled.

[1] 1916, Mitt. Zool. Mus. Berlin, VIII, No. 2, p. 261.

Skull of type similar to the skull of *cupreus* and exhibiting the characters of teeth and zygomata that distinguish *cupreus* from *albertisii;* distinguishable from *cupreus* only by its smaller size, and by the broadly rounded posterior end of the combined nasals in contrast to the more or less W-pattern of *cupreus* proper.

MEASUREMENTS OF TYPE.—Head and body, 395 mm.; tail, 310; hind foot (s.u.), remeasured, 41.5; skull, condylobasal length, 70.3; occipitonasal length, 66.0; basal length, 66.5; zygomatic breadth, 43.9; interorbital breadth, 7.3; nasals, 20.0 × 11.7; crowns, p^4–m^4, 22.0; crowns m^{1-3}, 14.5; crown dimensions of m^1, 4.9 (length at middle of crown, not at outer edge), by 4.2 (width); of m^4, 4.0 by 3.8.

Besides the type, we refer two other specimens taken by Archbold and Rand to *cupreus obscurior,* one an adult male also from Mt. Tafa, and the other a juvenal male from Mafulu, 1700 meters.

Thus it appears that the race *obscurior* occupies the southern slopes of the main range at least between 1700 and 2400 meters. Our animals which we refer to true *cupreus* were taken at Mt. Tafa, 2500 meters, and at Murray Pass, Mt. Albert Edward, 2860 meters. *Obscurior* requires comparison with *beauforti* of the Noord River region, southern Dutch New Guinea.

Pseudochirus (Pseudochirulus) forbesi longipilis, new subspecies

TYPE.—No. 104037, American Museum Natural History; ♂, adult; Mave, Tafa Range, Central Division of Papua; 2225 meters; September 6, 1933; collectors, Richard Archbold and A. L. Rand. The type is a skin and skull in good condition.

GENERAL CHARACTERS.—The mountain representatives of *Pseudochirus forbesi* but with long, very dense pelage.

DESCRIPTION.—Dorsal pelage of type composed of long soft fur from 13 to 15 mm. in length (10 mm. in true *forbesi*), the scattered guard-hairs reaching 20 mm. Color only very slightly darker than in characteristic *forbesi*, namely, tawny orange on cheeks and head, merging into the dull brownish gray of the body; an indistinct darker band near bone brown running from withers to sacrum; the tail dull wood brown, becoming almost black distally. Hands and forearms dull tawny; feet cartridge buff to cream buff. Ventrally cream buff on throat and chest, becoming cartridge buff on belly, and deepening again to cream buff in inguinal region. All ventral hairs gray-based; their length 10–15 mm. (5–8 mm. in true *forbesi*). Ventrally body color carried for some 3 cm. down under surface of tail, gradually becoming wood brown. Bare under surface of tail about 120 mm. Pattern of head, face, and ears just as in *forbesi.*

Skull of type virtually identical to that of true *forbesi,* displaying similar fenestration of both maxillary and palatine portions of palate, similar degree and location of the inflation of the auditory region.

MEASUREMENTS.—Head and body of type, 256 mm.; tail, 259; hind foot, "35.6"; basal length of skull, 46.2; zygomatic breadth, 29.2; interorbital breadth, 5.8; mastoid breadth, 25.2; nasals, 16.3 × 7.6; palatal length, 25.2; crowns p^4–m^4, 14.6; crowns m^{1-3}, 10.0; crown width of m^1, 2.5.

Evidence favoring the recognition of this mountain race of *forbesi*

rests upon the type and a second male (topotype, but from 2400 meters) of equal age and possessing similar characters of pelage. Lack of anatomical characters in the skull to accompany the differences in the fur only emphasizes the view that *longipilis* is purely an offshoot of *forbesi* adapted to conditions in the highlands. The two races may intergrade, but the fact that a specimen of typical *forbesi* taken from the eastern slope of Mt. Tafa only a few hundred meters lower than *longipilis* is in no respect intermediate indicates that the latter is likely to be an upland race distinct from the lowland race *forbesi*.

PHALANGER STORR

This genus, with type *orientalis* from Amboina, off the coast of Ceram, comprises four strongly marked species groups, namely: *orientalis, celebensis, ursinus, maculatus*. The first only has speciated freely, giving rise, in addition to the several "subspecies" of *orientalis*, to such well-marked full species as *leucippus* and *sericeus*. Stein[1] has tentatively suggested groupings of the members of the *orientalis* group, and Schwarz[2] has recently published certain conclusions based on pelage, with some of which (particularly making *celebensis* a subspecies of *orientalis*, p. 88) we cannot concur. For the remaining groups, names are already available, should it be considered desirable to set them off as subgenera at some future time.

Phalanger brevinasus, new species

TYPE.—No. 104100, American Museum Natural History; ♂, adult; Mafulu, Central Division of Papua; 1250 meters; October 24, 1933; collectors, Richard Archbold and A. L. Rand. The type is a skin and skull in good condition.

GENERAL CHARACTERS.—A large phalanger of general *orientalis* type, and of size very slightly less than true *orientalis*, colored very pale, uniform mouse-gray with a brownish cast, the dorsal line moderately developed. Skull with premaxillae and i^{1-1} thrown well forward but at the same time nasals quite short.

DESCRIPTION.—Pelage of type soft, short (about 15 mm. on the back) and dense, the color light mouse-gray with a slight brownish cast, becoming light buffy gray over the glandular area above the base of the tail; dorsal stripe light fuscous, of less intensity on neck and terminating at sacral region; face, cheeks, sides of neck, lower part of sides of body, insides of limbs, and inguinal area a very pale gray, approaching drab-gray of Ridgway; hairs of tail above buffy mouse-gray, below light drab; dorsal hair extended for 180 mm. along tail; ears light fuscous, their margins naked; vibrissae black; dorsal color of hands and feet light drab. Naked part of tail coarsely granulated proximally beneath, flesh-colored with some darker mottlings. Under parts, with exception of chin which is between drab and hair brown, between white and cartridge buff, the lower throat and upper chest suffused with cream buff.

[1] 1933, Zeitschr. Säugetier-k., VIII, Heft 2, pp. 90–91.
[2] 1934, Proc. Zool. Soc. London, pp. 88–91.

Skull of type with the outline of true *orientalis* but supraorbital ridges less separated and interorbital trough narrow; nasals short, their tips but little (1.5 mm.) exceeding the nasal notch, their narrowest point just anterior to maxilla-premaxilla suture, their broadened proximal parts reaching to 2 mm. from lacrimal, their posterior V-suture wide and entering only 6 mm. between the anterior swellings of the frontals; premaxillae projecting from 6 to 7 mm. beyond nasals and first incisors markedly proödont; palate as in *orientalis;* mastoid width much greater than in *orientalis*, 85 per cent of zygomatic width, as compared with 75 per cent in true *orientalis;* mastoid-squamosal support for stylohyoid apparatus more extended laterally but less inflated anteroposteriorly than in *orientalis;* depression between paroccipital process and basioccipital shallower than in *orientalis;* alisphenoid "bulla," by covering more of tympanic, making a much broader contact with mastoid.

TEETH.—Canines lacking the incipient anterior cuspule sometimes to be noted in *orientalis;* p^4 smaller and simpler than p^4 of *orientalis;* molar series exhibiting more size-gradient from m^1 to m^4 than in *orientalis.*

DIMENSIONS.—Skin of type, head and body, 440 mm.; tail, 395; hind foot (s.u.), 57[1]; skull, basal length, 79; zygomatic breadth, 56.2; mastoid breadth, 47.5; nasals, 29 × 14.3; palatal length, 46; interorbital width, 9.7; crowns $p^4 - m^4$, 24.3; crowns m^{1-3}, 15.8; crown dimensions, p^4, 5.1 × 4.1; m^1, 5.3 × 4.4; m^2, 5.0 × 4.8; m^3, 4.5 × 4.4; m^4, 4.4 × 4.1; width posterior lamina of p^4, 3.3.

Besides the type we have before us a second male skin and skull, slightly younger but otherwise the same, and a skull without skin, both topotypes.

In addition to the mouse-gray *P. brevinasus* we have to describe two distinct forms of *Phalanger* with a rufous pelage which are at once separable from one another by their teeth, m^{1-3} in the one, from Central Division of Papua, measuring 15.8 mm., and in the other, from Western Division (Oriomo River), only 13.2 mm.

Thomas[2] writes of "the well-known red juvenile phase" [of *orientalis*], while synonymizing *Pseudochirus vulpecula* Foerster with *Phalanger orientalis* (Pallas); and the name *rufa* was applied by Geoffroy[3] to a form of *Phalanger* which Jentink[4] (and everybody after him) includes in the synonymy of *orientalis.* Foerster's juvenal specimen of *vulpecula* was described as having the tail with the "last 115 mm. . . . naked, black," and although it came from the Huon region it is not improbably related to our reddish forms. *Rufa* Geoffroy is best regarded as unidentifiable. With due respect for the opinion of Thomas (cited), we feel that in the present rufous-hued phalangers we are concerned with forms that are *not* closely linked genetically with *orientalis.* Our series in each instance is too uniform and there is lacking any local normally colored repre-

[1] Field measurement.
[2] 1922, Ann. Mag. Nat. Hist., (9) IX, p. 673.
[3] 1803, Geoffroy St.-Hilaire, É., 'Cat. du Muséum,' p. 149.
[4] 1885, Notes Leyden Museum, VII, p. 93.

sentative of *orientalis* to which the rufous animals may be recessive (or dominant?) when crossed. It is true that the large-toothed rufous phalangers have skulls that to a considerable degree match the skulls of *brevinasus* (whose female is not known), but we have yet to be convinced that the former *is* the female of *brevinasus*, for the young males collected at several lowland stations are even more strongly rufescent than the single adult female is. Accordingly, we describe the large-toothed form provisionally and the small-toothed series (from Oriomo River) as almost certainly new.

Phalanger matsika, new species

TYPE.—No. 104103, American Museum Natural History; ♀, adult (though teeth scarcely worn); Matsika, Angabunga River, Central Division of Papua; 950 meters; November 22, 1933; collectors, Richard Archbold and A. L. Rand. The type is a skin in good condition and a skull with left m^4 lost.

GENERAL CHARACTERS.—A reddish-gray phalanger with naked portion of tail black, dark brown chin, sides and inguinal area, and creamy white from throat to pouch; the skull very close in structure to that of *brevinasus*.

DESCRIPTION.—Dorsal pelage of type near natal brown, the individual hairs often with a metallic glint, becoming duller, near bone brown on head, sides, rump and base of tail; dorsal line fuscous, well developed from crown to lumbar region; length of back pelage, 20–25 mm.; fore and hind limbs near natal brown; a straw-colored spot behind and below ear; under parts from back of chin to pouch near cartridge buff, the width of the pale area from 4 to 6 cm.; the whitish area surrounded by color changing between verona brown, benzo brown, and sepia (varying with degree of wear of the verona brown hair-tips), which colors cover chin, sides of neck, insides of limbs, lower sides of body and base of tail; ears with tips bare, fuscous; bare part of tail fuscous, but a suggestion of flesh-color on prehensile inferior surface.

Skull of type with frontals swollen so as largely to eliminate the interorbital trough anteriorly; interorbital ridges little separated; nasals with wide posterior V-suture and exceeding nasal notch only slightly (2 mm.); mastoid width great; mastoid and audital set-up very similar to that in *brevinasus;* posterior palatal openings small, only 30 per cent of palatal length.

TEETH.—I^2 not reduced from its normal large size; p^4 moderately large with shear faces, its tip doubled; molars large as in *brevinasus* and in the *sericeus* group; m^4 level with back of palate.

MEASUREMENTS.—Head and body of type (female), 402 mm.; tail, 373; hind foot (field measurement, s.u.), 58; skull, basal length, 71.2; zygomatic breadth, 44.5; interorbital breadth, 10.1; nasals, 26.5 × 12.7; palatal length, 41.0; crowns, p^4–m^4, 24.3; m^{1-3}, 15.8; crown dimensions, p^4, 4.9 × 4.0; m^1, 5.1 × 4.4; m^2, 4.8 × 4.5; m^3, 4.8 × 4.4; m^4, 4.4 × 3.9.

We refer to this form six additional specimens: two juvenals, male and female, topotypes; juvenal male from Bellavista, 1450 meters; juvenal male from Mafulu, 1250 meters; juvenal female from Deva Deva, 770 meters; and juvenal male from Ononge, 1860 meters. The last mentioned is not only strongly rufescent (near tawny or russet) but

even carries in its pelage occasional black guard-hairs such as Foerster described in *vulpecula*.

The dimensions of the teeth (the only anatomical parts safely comparable between adults and young) are remarkably constant and furnish a ready means of distinguishing *matsika* from the species next to be described.

Phalanger microdon, new species

TYPE.—No. 104401, American Museum Natural History; ♀, adult; Dogwa, Oriomo River, Western Division of Papua; 30 meters; February 27, 1934; collectors, Richard Archbold and A. L. Rand. The type is a skin and a skull with the occipital region somewhat broken.

GENERAL CHARACTERS.—A strongly reddish species possibly related to *"Pseudochirus vulpecula"* (see our remarks above); dorsal line moderately distinct; ventral color from throat to pouch broadly white but otherwise grayish brown; skull with extremely small teeth only equaled by the small-sized *celebensis* of Celebes and *breviceps* of the remoter Solomon Islands.

DESCRIPTION.—Pelage of back of type reaching 15 mm., its general color between orange-cinnamon and mikado brown but with an added kinkiness that provides a distinct luster; dorsal line fuscous, reaching, with a slight break at the neck, from crown to sacrum; lower rump and base of tail somewhat paler and duller, near sayal brown or ochraceous tawny, which color appears also on face, limbs, hands, and feet; a light buffy spot behind each ear; vibrissae black basally, their tips whitish; naked part of tail entirely black; under parts, from just behind the ochraceous tawny of the chin to the pouch dull white, that color extending broadly across the chest (10 cm.) and onto fore limbs, but sternal area well tinged with cream buff; the narrow interval between the rufous dorsal and whitish ventral areas, together with the whole inguinal region and inside of hind limbs, army brown; under parts of tail and anal area cinnamon.

Skull of medium size to small, essentially similar in structure to those of *matsika* and *brevinasus* and, like them, provided with very widely expanded mastoids; palate extending far behind the last molars, due to the small size of the teeth; posterior palatal openings slightly more than one-third of length of palate.

Teeth remarkably small: i^2 crown only 2.7 mm.; a slight space between i^3 and c; p^4 small and relatively simple; a well-marked size-gradient in the molars.

MEASUREMENTS.—Skin of type, head and body, 396 mm.; tail, 324; hind foot (s.u., field measurement), 54.8; skull, basal length, 72.5; zygomatic breadth, 47.9; interorbital breadth, 12.6; mastoid breadth, 42; nasals, 27.4 × 12.7; palatal length, 42.0; crowns, p^4–m^4, 21.0; m^{1-3}, 13.2; crown dimensions, p^4, 4.0 × 3.6; m^1, 4.5 × 3.6; m^2, 4.2 × 3.8; m^3, 3.9 × 3.7; m^4, 3.9 × 3.5.

Besides the type there are two subadult females and one juvenal male topotypes. The larger of the females is somewhat darker than the type and both have the white of the under parts narrowed on the chest to 3 cm. In the juvenal male the rufous takes on a sandy tone, resulting in a dorsal color near sayal brown or ochraceous tawny; the head and neck are slightly darker; the dorsal stripe appears obsolescent.